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PROVISIONAL SPECIFICATION.

Improvements in Instruments for Plugging or Filling Teeth.

I, ALFRED CANE, of No. 6 Turk Street, in the city and county of San Francisco, State of California, United States of America, Dentist, do hereby declare the nature of this invention to be as follows:—

This invention relates to improvements made in that class or description of dental
5 operating instruments known as pluggers, by means of which gold-foil and similar fillings are fixed in teeth; and my invention has for its object to produce an instrument that will operate by pressure and impart a rotative movement at the time of contact of the operating point of the tool with the filling material.

To such an end and object the nature of my said invention consists in a body or
10 handle-portion formed of metal tubing and having on one end a tubular socket-piece enclosing and carrying a short metal spindle; such spindle being fitted in said socket-piece to slide longitudinally and smoothly a limited distance, is also fitted to rotate therein through the agency of a spiral groove cut around the part of the spindle within the socket-piece and a fixed pin in such socket-piece setting into the groove,
15 the construction and arrangement being such that a partial rotation of the spindle is produced as it is moved back longitudinally in the socket-piece by pressing on the outer end of the spindle, it being understood that the length of the aforesaid spindle is somewhat greater than the socket-piece so that it projects at one end beyond the socket-piece.

20 In this exposed or projecting end of the spindle is a screw-threaded socket to receive and hold firmly the filling-point or tool, of which a variety of styles, shapes and sizes is generally employed by the dentist to suit particular or special forms, sizes or location of cavities in the tooth to be operated upon.

These filling-points being detachable from the spindle are fixed therein by a screw-
25 threaded shank on the end fitted to screw into the before-mentioned socket of the spindle.

Within the body-portion of this instrument a short cylindrical block or piston is fitted to slide and is set to rest and bear upon the head of the spindle in the socket-piece before mentioned, and between the closed upper end or head of the said tubular
30 body-portion and the aforesaid block or piston a helical spring is interposed, the function of which is to give resistance to the backward movement of the spindle in the thrust or pressure of the filling-point in the end of the spindle against the foil in the cavity. The amount or degree of such pressure is regulated by an adjusting screw working through the head of the body-portion against a disc or plate resting on
35 the top of the helical spring, so that by turning the adjusting-screw against such plate the spring may be compressed to a greater or less degree and its tension increased.

This instrument is thus constructed to hold and operate a filling-point by pressure alone without percussion and with a rotative movement of the filling-point while it is
40 in contact with the filling material in the cavity being operated on. Such rotative movement is a limited one, however, and is so regulated and determined by the pitch and length of the spiral groove in the spindle that the rotation given to the extreme

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end of the filling-point is of proper character to condense the foil without boring into or disintegrating the layers; the length of such rotative movement should be less than a complete turn or revolution of the filling-point in every working thrust or pressure of the tool against the filling, and usually is limited to about three quarters of a complete revolution of the spindle in the socket-piece. 5

Dated this 9th day of July 1896.

HASELTINE, LAKE & Co.,
45 Southampton Buildings, W.C., Agents for the Applicant.

COMPLETE SPECIFICATION.

Improvements in Instruments for Plugging or Filling Teeth. 10

I ALFRED CANE of No. 6 Turk Street in the city and county of San Francisco State of California United States of America Dentist do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

This invention relates to an improvement made in that class or description of 15 dental operating instruments known as Pluggers, by means of which gold-foil and other like fillings are fixed in teeth; and the said invention has for its object to produce an instrument that will operate by pressure and impart a rotative movement of the plugging-point or tool at each time of contact with the filling.

To such end and object the nature of the said invention consists in a body or 20 handle-portion formed of tubing and having on one end a tubular socket-piece enclosing and carrying a short spindle, such spindle being fitted to slide longitudinally a limited distance in said socket-piece and also to rotate therein through the operation of a spiral groove in the spindle and a fixed pin in the socket-piece setting into the groove, the construction of these parts being such that a partial rotation of the spindle 25 is produced by the pressure brought to bear against the point of the tool fixed in the end of the said spindle as said point is pressed against the filling in the Tooth-cavity.

The end of the spindle projecting beyond the end of the socket-piece is provided with a screw-threaded socket as a means of hold firmly the filling-point or tool, and of allowing the same to be changed as the character of the work to be done may 30 require from time to time, the butt ends of the filling-points being screw threaded to fit the said socket in the end of the spindle.

A short cylindrical block or piston is fitted to slide smoothly within the tubular body-portion of the instrument and bear against the head of the spindle in the socket-piece, and a helical spring placed between the back end of the aforesaid block and 35 the head or closed end of the tubular body-portion is employed to give pressure against the block.

The function of the piece last mentioned is to give resistance to the backward movement of the spindle in the thrust or pressure of the filling-point against the filling in the tooth-cavity. 40

The amount or degree of such pressure is regulated by an adjustable screw working through the head or end of the tubular body-portion aforesaid against a plate or disk resting on the end of the helical spring, so that by turning the said screw downwards against said plate the spring may be compressed to a greater or less degree and its tension thereby increased or modified. 45

The instrument as thus constructed to hold and operate a filling-point or tool is intended to operate by pressure alone without percussion and with a partially rotary movement of the filling-point while it is in contact with the filling material in the cavity being operated on.

Such rotative movement, however, is a limited movement and is so regulated and 50 determined by the pitch and length of the spiral groove in the spindle that the

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rotation given to the extreme end of the filling-point is of a proper character to condense the filling-material without boring into or disintegrating the layers thereof.

The length of such rotative movement should be less than a complete turn or revolution of the filling-point in every working thrust or pressure of the tool against the filling and is usually limited to about three-quarters of a complete revolution of the spindle in the socket-piece.

In the accompanying drawing to which reference is made in the following description by figures and letters:—

Figure 1 represents a dental plugger constructed in accordance with the said invention for filling cavities in the upper jaw, a portion of the case or tubular body-portion being broken away and some of the internal parts being represented in section.

Figure 2 is a view of the same instruments in longitudinal section illustrating the position assumed by the operating parts before the filling-point is pressed against the foil in the tooth cavity and before the spring is compressed.

Figure 3 is a side view of the pressure block or piston.

Figures 3^a and 3^b are end views of the said piece.

Figure 4 is a detail view of the rotating spindle or tool-holder, the socket bearing end being shown in section.

Figure 5 is a longitudinal section of the socket piece on the end of the tubular body portion.

Figure 6 is an end view of the same piece.

Figure 7 represents a construction of handle specially provided for reaching and working in cavities that cannot be reached and operated on to advantage with the other form of instrument.

Figures 8 and 9 are views in detail of the adjustable socket-piece used in the form of instrument shown in Figure 7 and of the spindle used with said socket-piece.

The body of this instrument is composed of the barrel (1) formed of a piece of straight tubing, a tubular socket-piece (2) fixed into one end of the barrel by a screw joint (3) and a nut or threaded block (10) fixed in the opposite end. The socket-piece (2) carries a spindle (4) in the outer end of which is fixed the filling-point or tool to be operated.

Against the head or inner end of such spindle the sliding-block or piston (7) is held by a helical spring (8) one end of which rests against the back of such block while the opposite end bears against an adjustable disk or plate (9) in the upper end of the tubular case.

This spring is arranged to give resistance to the backward movement of the spindle (4) in the socket-piece under the thrust or pressure of the tool upon the filling and the amount or degree of this resistance is varied by regulating the tension of the spring. For this purpose the plate (9) is fixed on the end of a screw-rod (11) working through a screw threaded socket in the fixed head (10) and the outer end of the rod is furnished with a milled head for turning the rod.

The spindle (4) is fitted in the socket-piece both to slide easily and to rotate smoothly within that part, for in its longitudinal movement the spindle is given a limited or partial rotary movement by means of a spiral groove (5) cut in the circumference of the spindle and a fixed pin (6) in the socket engaging the groove, so that the spindle turns in the socket-piece as it is pressed back.

The points or tools (A) one form or style of which is illustrated in Figures 1 and 2 are fixed in the outer end of the spindle (4) usually by means of a screw-threaded socket (4^a) provided in the end of the spindle, but any of the well-known means of securing such points in the instrument may be employed where the same are of a form or kind that will not be loosened by the rotary movement of the tool.

Usually the head of the spindle is rounded to fit a cavity (7^a) in the face of the block (7) so that the resistance of the spring is maintained as nearly as possible at all times on the axial line or centre of the spindle.

The backward movement of the spindle in the socket-piece is limited by the fixed pin (6) striking the end of the groove (5) or by the collar (4^b) on the outer end of the

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spindle while the opposite or outward throw is limited by a cross-pin (12) in the spindle set to engage a shoulder (13) in the socket-piece (2).

For special work in filling cavities that would be difficult to reach and operate on with the filling-point situated in a straight line with the handle of the instrument as hereinabove described I provide a construction of handle in which the socket-piece 5 can be adjusted to stand at different angles with respect to the handle. In this modification as shown in Figures 7 8 and 9 of the drawing the socket piece (14) has a toothed segment (15) projecting from one side and fitted to turn between two ears or knuckles (16) on the end of the tubular handle portion (17) like the knuckle of a hinge and secured therein by a screw (18). A screw-threaded rod (19) extends 10 through the handle-portion from the head (10) at which point it works in a threaded bearing. By rotating the milled head (20) on this rod its opposite end is moved forward into the teeth of the segment (15), thus forming a simple and readily operated means of adjusting and locking the socket-piece in any required angular position on the handle. 15

The pin 21 in the socket-piece engages the spiral groove (5) of the spindle and the helical spring (22) is placed directly around the spindle behind a flanged head (23) on the end of the spindle between that part and a seat (24) in the socket-piece.

In this modification the helical spring produces the same yielding resistance to the backward movement of the spindle while the spiral groove and the fixed pin together 20 produce the required rotative movement of the spindle.

The effect of the limited rotative movement of the filling-point upon the filling-material is to impart a rubbing or burnishing action to the filling-point without tearing or disintegrating the layers in the work of building up a filling and thus to produce solidity and uniform density in the finished work quite equal to that obtained 25 with plugging instruments that operate by blows or the impact of the tool upon the filling.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is 30

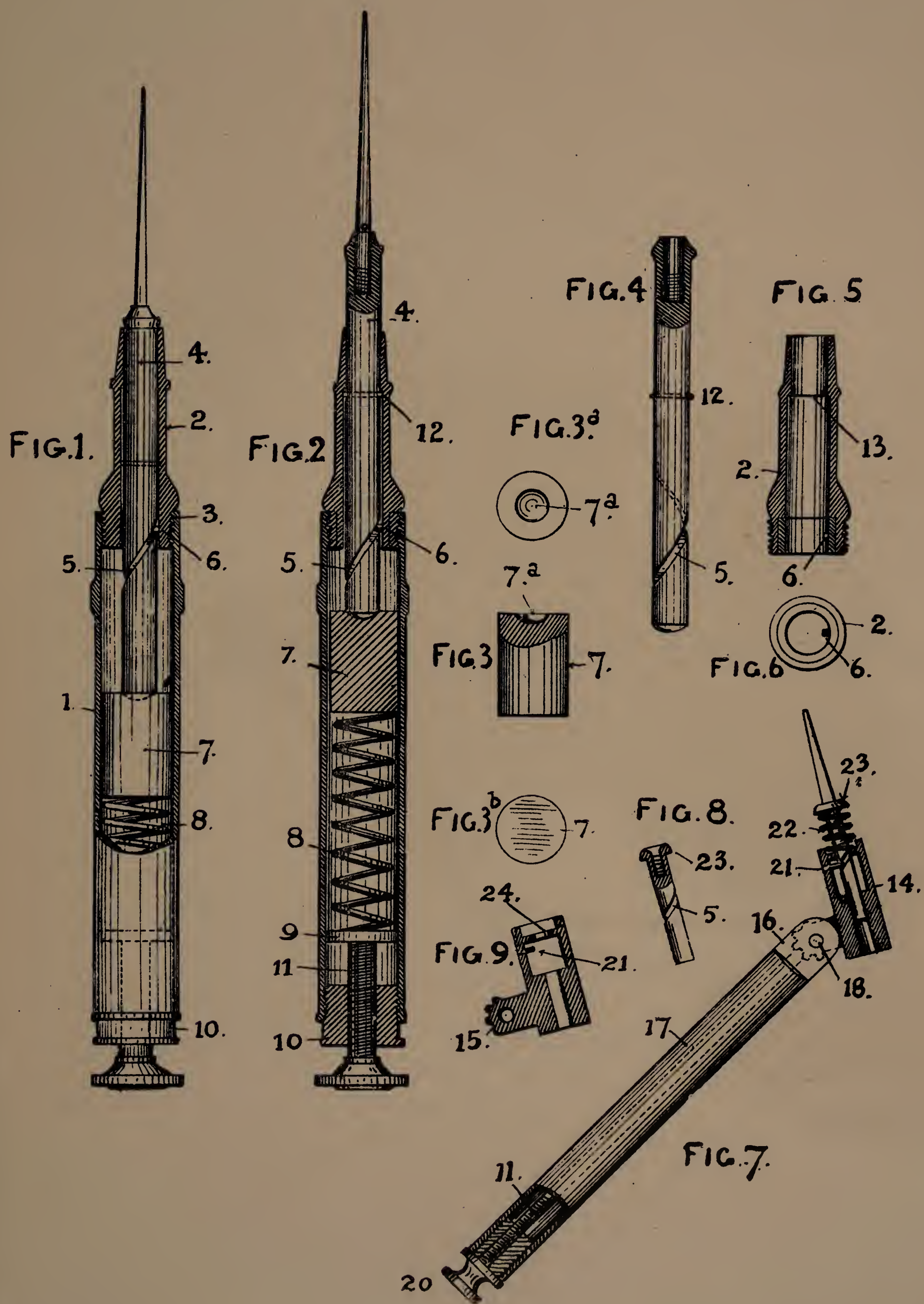
The dental plugger herein described consisting of the tubular handle-portion having the tubular socket-piece on one end the spindle adapted to slide longitudinally and to rotate in said socket-piece and having a tool-holding socket in the outer end a spiral groove in said spindle and a fixed pin in said socket-piece engaging said spiral groove whereby the longitudinal movement of said spindle causes it to rotate in the 35 socket-piece a spring arranged to give pressure against the inner end of the spindle and to be compressed by the thrust of the filling-point against the filling said parts being arranged as described to produce a limited rotary movement of the filling-point simultaneously with its pressure against the filling-material.

Dated this 9th day of April 1897. 40

HASELTINE, LAKE & Co.,
45 Southampton Buildings, London, W.C., Agents for the Applicant.

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[This Drawing is a reproduction of the Original on a reduced scale]

